Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Form PCT/IPEA/416
63020		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/EP2004/050354	24.03.2004	01.04.2003
International Patent Classification (IPC) or national classification and IPC		
Applicant		
THALES		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *(sent to the applicant and to the International Bureau)* a total of 3 sheets, as follows:
      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☒ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s))

      _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/050354

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

☐ international search (Rule 12.3 and 23.1(b))

☐ publication of the international application (Rule 12.4)

☐ international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

☐ the international application as originally filed/furnished

☒ the description:

pages 1-5 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____

☒ the claims:

nos. _____ as originally filed/furnished

nos.* _____ as amended (together with any statement) under Article 19

nos.* 1-13 received by this Authority on 11.02.2005 with letter of 01.02.2005

nos.* _____ received by this Authority on _____

☒ the drawings:

sheets 1/2-2/2 as originally filed/furnished

sheets* _____ received by this Authority on _____

sheets* _____ received by this Authority on _____

☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, nos. _____

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

4. ☒ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

☐ the description, pages _____

☒ the claims, nos. 10

☐ the drawings, sheets/figs _____

☐ the sequence listing *(specify)*: _____

☐ any table(s) related to sequence listing *(specify)*: _____

* *If item 4 applies, some or all of those sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/050354

Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	3-5, 7-9	YES
	Claims	1, 2, 6, 10-13	NO
Inventive step (IS)	Claims		YES
	Claims	1-13	NO
Industrial applicability (IA)	Claims	1-13	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

1. Documents

In the present report, reference is made to the following documents:

D1: US-A-4 562 438 (WILKINSON CHRISTOPHER F ET AL) 31 December 1985 (1985-12-31)

D2: US-A-5 212 490 (NELSON DAVID E ET AL) 18 May 1993 (1993-05-18)

D3: EP-A-0 898 176 (STN ATLAS ELEKTRONIK GMBH) 24 February 1999 (1999-02-24)

D4: CARMILLET V ET AL: "Low-speed targets sonar detection using auto regressive models in reverberation; experimental performances for wideband signals" 28 September 1998 (1998-09-28), OCEANS '98 CONFERENCE PROCEEDINGS NICE, FRANCE 28 SEPT.-1 OCT. 1998, NEW YORK, NY, USA, IEEE, US, PAGE(S) 1285-1289, XP010311934 ISBN: 0-7803-5045-6

D5: US-A-2 431 854 (WOOD LEON G S) 2 December 1947 (1947-12-02)

D6: FR-A-2 769 372 (THOMSON MARCONI SONAR SAS) 9 April 1999 (1999-04-09)

2. With regard to the provisions of PCT Rule 70.2(c)

The present report has been drawn up as though the amendment to **claim 10** had not been made, because said amendment, namely the passage "uses jointly", appears to go

beyond the scope of the invention in the international application as filed (PCT Rule 70.2(c)). In particular, these words do not appear anywhere in the description as filed.

3. **With regard to the provisions of PCT Article 33(2)**
The subject matter of **claims 1, 2, 6, and 10 to 13** fails to meet the requirements of novelty of PCT Article 33(2).

3.1 D1 discloses the subject matter of **independent claim 1** (setting aside the lack of clarity, cf. paragraph 5.1):

- method for processing received signals **corresponding to a transmitted signal recurrently comprising two pulses** (column 1, lines 6 to 10), one **Doppler-tolerant broadband pulse** (column 1, line 59: "frequency modulation (e.g., frequency sweeping)"[*]) and one **Doppler-sensitive broadband pulse** (column 1 , line 59: "frequency modulation"; column 1 , lines 60 to 61: "phase modulation"; column 1, line 61: "linear or non-linear" [*]), comprising:
- an **object detection step carried out on the portion of the received signal corresponding to the pulses** (cf. paragraph 5.1: to the Doppler-tolerant pulses) and providing an alarm for each object detected (column 2, lines 7 to 11),
- and a detected object classification step (this is performed by all radar or sonar systems)
- **wherein classification of the detected objects is carried out on the portion of the received signal corresponding to the Doppler-sensitive pulses for the alarms complying with at least one predetermined criterion** (column 2, lines 11 to 16; column 4, lines 39 to 44).

[*] It is well known that non-linear frequency modulations

are relatively insensitive to Doppler, unlike binary frequency or phase modulations, which are sensitive to Doppler (cf. for example D2: column 1, lines 64 to 65; column 4, lines 19 to 27; D3: column 1, lines 46 to 55; column 2, lines 39 to 42).

3.2 D4 discloses the subject matter of **independent claim 10** (as initially filed, cf. paragraph 2; setting aside the lack of clarity, cf. paragraph 5.2):

- a signal processing method (abstract) characterised in that
- a first pulse is **HFM**-type (column 6, lines 10 to 22),
- and/or a second pulse is **BPSK**-type (column 6, lines 23 to 30).

3.3 **Independent claim 11** defines the device corresponding to the method according to **claim 1**, with the additional feature of an "active sonar". However, this feature is also described in D1 (column 6, line 23).

3.4 D1 also discloses the additional feature of **dependent claim 2**:

- the predetermined criterion applied to the alarms comprises **comparing the alarms with a predetermined threshold** (column 2, lines 11 to 16; column 4, lines 40 to 44).

3.5 Furthermore, D1 discloses the additional feature of **dependent claim 6**:

- a **Doppler estimation step** (column 5, line 52; column 6, line 11) wherein the alarms corresponding to the Doppler-sensitive pulses for the alarms **satisfying at least one predetermined criterion** (column 2, lines 11 to 16; column 4, lines 40 to 44)), and/**or** the associated standard deviations are estimated.

3.6 D1 also discloses the additional feature of **dependent claim 12:**

- the transmitting means transmit the two pulses **at different times with frequency bands that totally or partially overlap** (column 1, lines 65 to 66; column 6, lines 25 to 27).

3.7 Furthermore, D1 discloses the additional feature of **dependent claim 13:**

- the transmitting means transmit the two pulses **simultaneously with separate frequency bands** (column 1, lines 67 to 68; column 6, lines 23 to 25).

4. With regard to the provisions of PCT Article 33(3)

The subject matter of **claims 3 to 5 and 7 to 9** does not involve an inventive step as defined by PCT Article 33(3).

4.1 The additional features of **dependent claims 3 to 5, 7 and 9** are a routine step for a person skilled in the art. They relate to **well-known signal processing measures.**

4.2 The additional feature of **claim 8,** namely **estimating the own Doppler,** is well known in radar or sonar systems (cf. for example D5, column 2, lines 28 to 39; D6, abstract).

5. With regard to the provisions of PCT Article 6

The present application fails to meet the requirements of PCT Article 6, since **claims 1, 10 and 13** are not clear.

5.1 **Independent claim 1** is unclear because there is no prior mention of "first pulses" (line 9).

Box No. V — Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

5.2 **Independent claim 10** is unclear because there is no prior mention of "the first pulse" and "the second pulse" (lines 12 to 13 of the original version, cf. paragraph 2).

5.3 With regard to **claim 13**, the reference to "any one of the preceding claims" is incorrect. The subject matter of **claim 13** is a device ("active sonar"). Said claim can therefore only refer to a claim of the same category, i.e. to **claims 11 or 12**.

6. Observation

The subject matter of the present application, as defined in the description (page 4, lines 19 to 21), namely that "the matched filtering processing on the BPSK channel signals **is performed only** on the alarms from HFM pulse processing", appears to involve an inventive step (PCT Article 33(3)). However, the independent claims are not sufficiently specific.